

Xiaowei Yang

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Professional Skills

Molecular skills:

- Excellent knowledge and experience of molecular genetics and genomics.
- CRISPR/Cas9-mediated gene editing in Lepidoptera
- DsRNA-mediated RNAi in Coleoptera and Hemiptera.
- General techniques of nucleotide and protein extraction, expression detection by qPCR and western blot.

Bioinformatics:

- Basic knowledge about bash, perl, R and common software in Linux system.
- Excellent knowledge and experience of genome resequencing, Genotyping-by-Sequencing (GBS) and amplicon sequencing, and experience of RNA-seq, too.
- Genetic map construction through GBS data.
- Geographical populations analysis based on SNPs data.

Insect rearing:

- About three years' experience on maintaining cabbage looper, cotton aphids, termite, ladybug, monarch butterfly and springtail.

Education Background

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| 2011/10 - 2014/01 | University of Kentucky | Lexington, US |
| | Visiting Scholar in Entomology, College of agriculture, food and environment. | |
| | Advisor: Dr. Xuguo Zhou, Dr. Qingwen Zhang | |
| 2008/09 - 2013/12 | China Agriculture University | Beijing, China |
| | Ph.D in Entomology, College of Agronomy and Biotechnology. | |
| | Advisor: Dr. Qingwen Zhang, Dr. Xiaoxia Liu | |
| 2003/09 - 2007/07 | Xi'an Jiaotong University | Xi'an, China |
| | Bachelor's degree in Bioengineering, College of Life Science and Technology. | |
| | Advisor: Dr. Xiaoyun Lu, Dr. Shuiyun Yang | |

Research Experience

- 2016/01 - present Mechanism of Bt resistance in cabbage looper *Trichoplusia ni*
- Genetic mapping of the resistance gene by high-throughput sequencing, including genome resequencing and bulked segregant analysis using RNA-Seq, on backcross populations.
 - Fine mapping by amplicon sequencing on backcross populations. Mapping the resistance gene to an 80kb region which contains 9 genes only.
 - Gene functional study by CRISPR/Cas9, verify the resistance gene.
- Genomic linkage map construction
- It's part of *T. ni* genome work. Sequencing a backcross population by GBS, discover the SNP by TASSEL.
 - Anchor and orient the scaffolds to chromosomes based on sequencing data using onemap package in R.
- 2015/01 - 2015/12 Geographic population analysis on two field lepidoptera species.
- Geographic population analysis by GBS data.
- 2014/06 - 2014/12 Sugar utilization and osmoregulation of phloem-feeding insects
- Investigate how RNAi against key osmoregulatory gut genes affect insect osmotic function and their survival on transgenic plants in whitefly and tomato/potato psyllids.
- 2011/10 - 2014/05 Developing a framework for assessing the RNAi risk in non-target insects
- Analysis western corn rootworm (WCR) dsRNA of V-ATPase effect on non-target insects including monarch butterfly, two species of ladybug and springtail.
- V-ATPase A sequences cloning in these species
 - dsRNA feeding to monarch butterfly, ladybug, and springtail.
 - Gene and protein expression analysis.
 - Bioassay analysis including development time, mortality, fecundity of monarch butterfly and ladybug.
- 2008/09 - 2011/10 Gene expression profiling in winged and wingless cotton aphids
- Research on wing polyphenism of cotton aphid. Compare the transcriptome of winged and wingless aphids. Focus on trade-offs between flight capability and reproduction.
- Investigate the transcriptomic difference between winged and wingless female adults by Illumina DGE sequencing.
 - Summarize the differential expressed transcripts and enrichment pathways. Parts of the transcripts are related to lipid and sugar metabolism.

Publications

Yang, X. *, Chen, W. *, Song X., Ma X., Kain W., Chu H., ...& Wang, P. (In preparation) A mutation of ABCA2 confers resistance to Bt toxin Cry2Ab in Lepidoptera

Chen, W. *, **Yang, X***, Tetreau, G., Song, X., Coutu, C., ...& Wang, P. (Revised) A high-quality chromosome-level genome assembly of a generalist herbivore, *Trichoplusia ni*. Molecular Ecology Resources (Accepted)

Yang, X. *, Pan, H. *, Yuan, L., & Zhou, X. (2018). Reference gene selection for RT-qPCR analysis in *Harmonia axyridis*, a global invasive lady beetle. Scientific reports, 8(1), 2689.

Yang, X. *, Liu, X. *, Xu, X., Li, Z., Li, Y., Song, D., ... & Zhou, X. (2014). Gene expression profiling in winged and wingless cotton aphids, *Aphis gossypii* (Hemiptera: Aphididae). International journal of biological sciences, 10(3), 257.

Pan, H., **Yang, X.**, Bidne, K., Hellmich, R. L., Siegfried, B. D., & Zhou, X. (2017). Dietary risk assessment of v-ATPase A dsRNAs on monarch butterfly larvae. Frontiers in plant science, 8, 242.

Tzin, V. *, **Yang, X***, Jing, X., Zhang, K., Jander, G., & Douglas, A. E. (2015). RNA interference against gut osmoregulatory genes in phloem-feeding insects. Journal of insect physiology, 79, 105-112.

Pan, H. *, **Yang, X.** *, Bidne, K., Hellmich, R. L., Siegfried, B. D., & Zhou, X. (2015). Selection of reference genes for RT-qPCR analysis in the monarch butterfly, *Danaus plexippus* (L.), a migrating bio-indicator. PLoS one, 10(6), e0129482.

Jing, X., White, T. A., **Yang, X.**, & Douglas, A. E. (2015). The molecular correlates of organ loss: the case of insect Malpighian tubules. Biology letters, 11(5), 20150154.

Pan, H. *, **Yang, X.** *, Siegfried, B. D., & Zhou, X. (2015). A comprehensive selection of reference genes for RT-qPCR analysis in a predatory lady beetle, *Hippodamia convergens* (Coleoptera: Coccinellidae). PLoS One, 10(4), e0125868.

Chen, W., Hasegawa, D. K., Kaur, N., Kliot, A., Pinheiro, P. V., Luan, J., ... & Xu, Y. (2016). The draft genome of whitefly *Bemisia tabaci* MEAM1, a global crop pest, provides novel insights into virus transmission, host adaptation, and insecticide resistance. BMC biology, 14(1), 110.

*authors contributed equally to this work.

Presentations

- 2017 Entomological Society of America (Denver, Colorado): “Mapping of Bt Cry2Ab resistance gene in the cabbage looper, *Trichoplusia ni*”.
- 2013 Entomological Society of America (Austin, Texas): “A first glimpse of non-target impact of the western corn rootworm dsRNA on ladybug using in vivo RNAi bioassay”.
- 2013 Entomological Society of America (Austin, Texas): “Cloning and characterization of cGMP-dependent protein kinase in a lower termite, *Reticulitermes flavipes*”.

Awards and Honors

- 2004 - 2005 “Siyuan” scholarship of Xi’an Jiaotong University
- 2004 Outstanding member of the Communist Youth League

Other Activities

- 2016-2018 Training and advise three summer scholar students for their projects. Training new members in the lab for experiments.
- 2014 Volunteer of Lexington Chinese New Year Celebration 2010.
- 2009 Teaching assistant in Molecular biology, with responsibility for experiment class.
- 2006 Volunteer of Xi’an Jiaotong University 110 Anniversary Celebrations.

Research Interests

- Molecular genetics and genomics
- The foundation of genetics and epigenetics
- Gene editing by CRISPR/Cas9 and other related technology

References

- Ping Wang Postdoctoral advisor
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- Xuguo Zhou Ph. D. advisor
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- Xiaoxia Liu Ph. D. advisor
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